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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,698	06/01/2001	Gerald Morrison	04694.00070	1792

27160 7590 07/15/2003

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EXAMINER	
NGUYEN, KIMNHUNG T	
ART UNIT	**PAPER NUMBER**
2674	8

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/870,698	MORRISON ET AL.	
	Examiner	Art Unit	
	Kimnhung Nguyen	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 7-13* is/are rejected.

7)☒ Claim(s) *4-6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4-7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This application has been examined. The claims 1-13 are pending. The examination results are as following.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Omura et al. (US patent 6,421,042 cited by Applicant).

Regarding claim 1, Omura et al. disclose in figure 1 a method of determining the position of an object relative to a reference frame (1a) from captured images (7L, 7R) of the object based on triangulation, the captured images being taken by at least two cameras (5) having an inherent overlapping fields of view within said reference frame, at least one of said cameras having an offset angle (beta) causing an extremity of the field of view thereof to extend beyond a boundary of said reference frame, the method comprising the steps of capturing an image of the object (see column 11, lines 16-17) using each said at least two cameras (5) at least one location within said reference frame (1a), determining the position of the object within each image and for each image placing the determined position into a coordinate system (see figure 1); and processing the determined positions to determined at least one of the position of the object at each location and the offset angle of said at least one camera (5, see figure 1).

Regarding claim 2, Omura e tal. disclose the position of the object within each image is represented by an angle (beta) (see figure 1), said angle being equal to the angle formed between the extremity of the field of view extending beyond the reference frame boundary and a line extending from the camera that intersects the object within the image.

Regarding claim 3, Omura et al. disclose the processing said angle is converted into a rectangular (X, Y) position within the reference frame coordinate system (see column 15, lines 57-63).

3. Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Takekawa (US patent 2001/0019325A1 cited by Applicant).

Takekawa discloses in figures 3-6 a computer (5, see figures 3-4), a computer readable media including a computer program thereon for determining the offset angles of cameras at different positions along a reference rectangular coordinate system (see coordinate input/ detection, see abstract) based on object position data generated by said cameras (CCD 39, figure 5-6), the object position data generated by each camera (CCD 39) representing the position of an object, the computer program including computer program code (see column 4, lines 40-51) for relating the object position data generated by each camera (39) to the rectangular coordinate system (see figures 4-6), and computer program code for mathematically calculating the offset angle of each camera based on the related object position data and position of said cameras relative said coordinate system (see column 6, lines 40-67 and column 6, lines 1-13).

Claim Rejections - 35 USC § 103

4. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omura et al. (US patent 6,421,042) in view of Gillespie et al. (US patent 6,414,671).

Omura et al. disclose in figure 1 a method of determining the position of an object relative to a reference frame (1a) from captured images (7L, 7R) of the object based on triangulation, the captured images being taken by at least two cameras (5) having an inherent overlapping fields of view within said reference frame, at least one of said cameras having an offset angle (beta) causing an extremity of the field of view thereof to extend beyond a boundary of said reference frame, the method comprising the steps of capturing an image of the object (see column 11, lines 16-17)using each said at least two cameras at at least one location within said reference frame (1a), determining the position of the object within each image being represented by an angle (see figure 1).

Furthermore, Omura et al. disclose a generally rectangular reference frame surround a touch surface (E, see writing surface), a camera adjacent each corner of the reference frame (5, see figure 1), and calculate the offset angles of at least two cameras (see figure 5, see column 15, lines 29-45).

However, Omura et al. do not disclose wherein the fields of view of al least two cameras are rotated with respect to the coordinate system; a method of calibrating said touch system, and subtracting the offset angle from the angle representing the position of the object within the image taken by the at least one camera to calibrate the angle and using the calibrated angles to calculate the position of the object with respect to the reference frame using triangular.

From the claim 10, it would have been obvious to one of ordinary skill in the art at the time the invention to have the fields of view of al least two cameras are rotated with respect to the coordinate system of Omura et al. because this would turn the graphic image so it is viewed at a different angles.

Gillespic et al. disclose a method calibrating of touch system (6) for recognizing gestures with an object on a touch sensor in figures 8-9, the method comprising a subtractor unit (194) that computes the signed different between Z (calibrated) and Oz (current off set by absolute different units 188 and 190, see figure 9) this subtractor is actually redundant with subtractor (172) see figure 8), the output (Cz) of this subtractor (172) is the calibrated Z value, and an estimate of the pressure finger (see column 24, lines 35-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teachings of using the output of a subtractor is the calibrated Z value as taught by Gillespic et al. into the system of Omura et al. because this would be asserted indicating the possible presence of a finger and ensured that the calibration make a conservative choice about the presence of a finger (see Gillespic et al., column 24, lines 59-67).

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Omura et al. (US patent 6,421,042) in view of Gillespie et al. (US patent 6,414,671) and in view of Ogawa et al. (US patent 5,502,568 cited by Applicant).

Omura et al. and Gillespie disclose a touch system including at least two cameras as discussed above. However, Omura et al. do not disclose the offset angle of each camera is

calculated using at least squares method. Ogawa et al. disclose a position of pattern (lines) projected on image pick surface by using squares method (see figure 8, see column 12, lines 34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement of using squares method as taught by Ogawa et al. into the touch system including two cameras of Omura et al.'s system because this would predetermined procedure from the point of view of computer processing (see column 12, lines 32-34).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takekawa (US patent 2001/0019325 cited by Applicant) in view of Trajkovic (US patent 6,531,999).

Takekawa discloses in figures 3-7 that a touch system a generally rectangular reference frame surround a touch surface one corner of the reference frame defining the origin of a reference frame of a coordinate system assigned to the touch surface; a camera adjacent each corner of the frame, the fields of view of said cameras (see optical unit 27L and 27R having two cameras 39, in figures 6-7) overlapping within the field; and a processor processing the captured images and generating object position data when an object appears in images , said processor determining the position of said object relative to the original in rectangular coordinates using said object position data based on triangulation (see figure 7), wherein the processor further executes a routine (see program code, see program 24 are executed, see page 4, left column, lines 40-51) to determine offset angles of the cameras, said offset angles being used by said processor to adjust said object position data prior to the position determination (see page 6, left column, lines 40-67). However, Takekawa does not disclose a executes a calibration routine to determine offset

angles of the cameras. Trajkovic disclose a calibration procedure that determines a unique reference point such as reference point for each user of the cameras system (see figure 1, column 2, lines 65-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teachings of using a calibration procedure determines a unique reference point such as reference point for each user of the cameras system as taught by Trajkovic into the system having program are executed of Takekawa because this would determine reference point for a given user and provide a pointing direction calibration for that user and also improve the accuracy of subsequent pointing direction (see column 3, lines 4-7).

Allowable Subject Matter

7. Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The present invention is directed to a method of determining the position of an object relative to a reference frame from captured image of the object based on triangulation and the captured images being taken by at least two cameras. The closest prior art, Omura (6,563,491) and Takekawa (2001/0019325A1) show a similar system also disclose the a reference frame from captured image of the object based on triangulation and the captured images being taken by at least two cameras. However, they fail to teach the method of claim 3 wherein each of the

cameras having a field of view offset with respect to said reference frame, and processing as cited in claim 4 (see copy of the equations of claim 4).

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimnhung Nguyen whose telephone number (703) 308-0425.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **RICHARD A HJERPE** can be reached on **(703) 305-4709.**

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D. C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only).

Hand-delivery response should be brought to: Crystal Park II, 2121 Crystal Drive, Arlington, VA Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kimnhung Nguyen
July 11, 2003

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600